

(12) UK Patent Application (19) GB (11) 2 274 623 (13) A

(43) Date of A Publication 03.08.1994

(21) Application No 9401598.9

(22) Date of Filing 27.01.1994

(30) Priority Data

(31) 9301570

(32) 27.01.1993

(33) GB

(51) INT CL⁵

B41F 27/12 // B41F 27/02

(52) UK CL (Edition M)

B6C CMA CMM CMP C604 C621 C626 C655 C656 C679

(56) Documents Cited

GB 2202186 A	GB 2061882 A	GB 1073139 A
GB 0851841 A	GB 0233932 A	EP 0214549 A
US 5088408 A	US 4628815 A	US 4561355 A
US 4291621 A	US 3496866 A	

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(58) Field of Search

UK CL (Edition M) B6C CJB CKF CMA CMB CMC CML
CMM CMP
INT CL⁵ B41F 27/02 27/12

(54) Mounting printing masters on cylinders.

(57) A printing master is mounted (either directly or via an intermediate support) to a printing cylinder by a plurality of discrete securing means linearly spaced along an axial generator of the cylinder, which securing means cooperate with complementary means at the head of the master (or its intermediate support).

Preferably the securing means comprise pins (13) which engage with holes (18) in the said leading edge, but embodiments employing magnets or an array of vacuum apertures are also contemplated. Magnets or vacuum apertures may be used in combination with pins and holes.

The invention is adapted to mount flexographic stereo plates via a thin flexible intermediate carrier sheet.

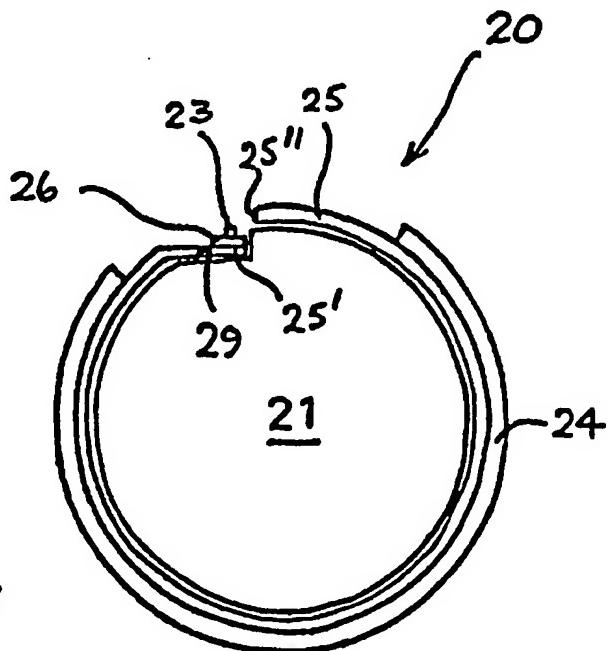


FIG. 3

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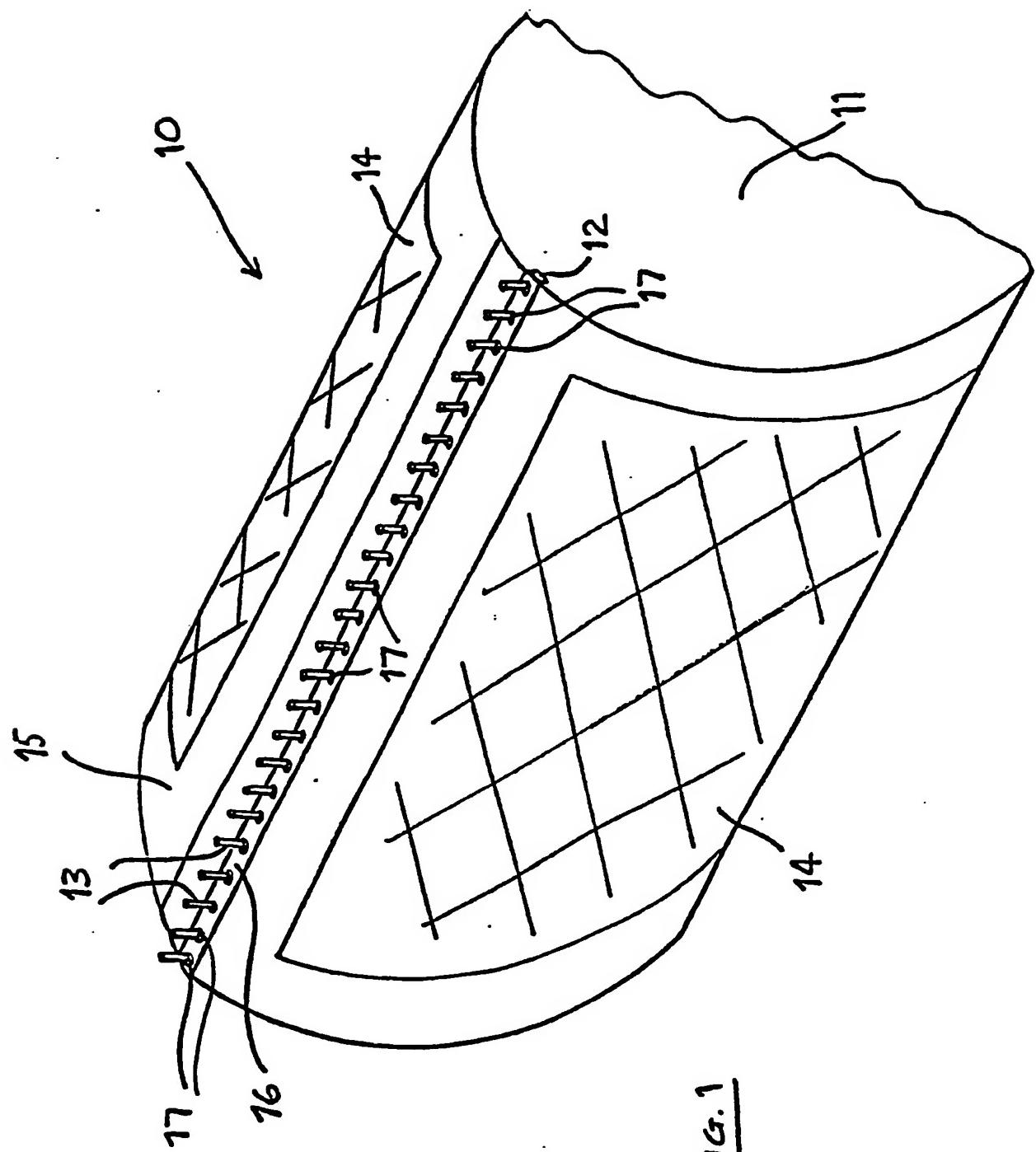


Fig. 1

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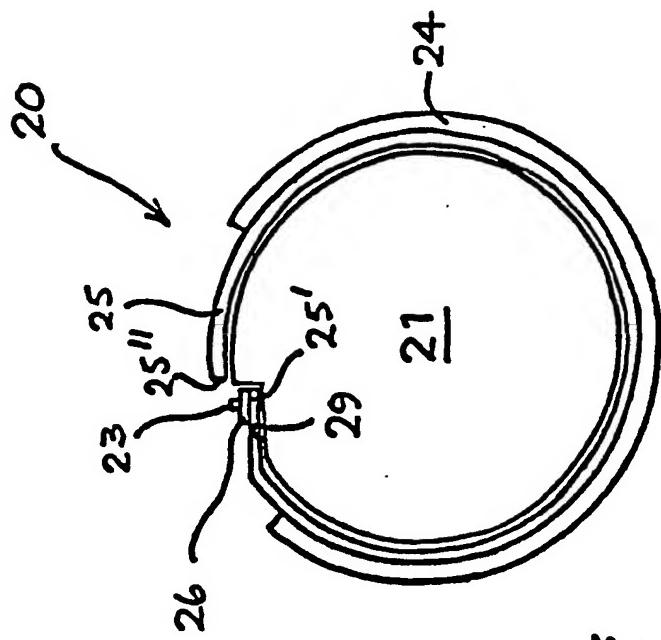


FIG. 3

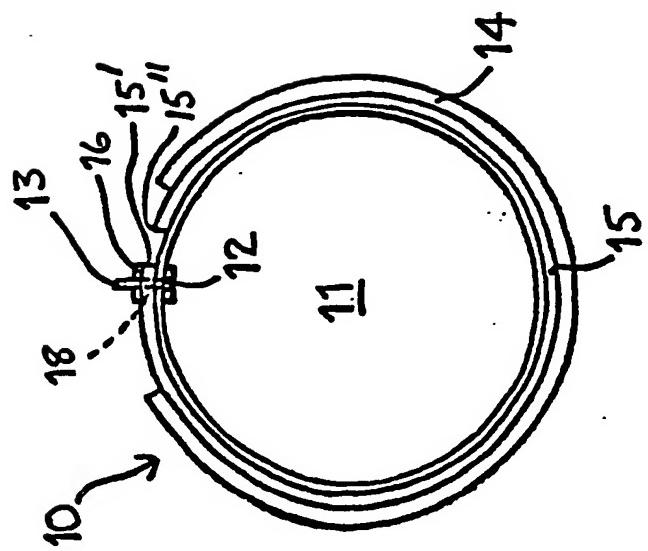


FIG. 2

PRINTING CYLINDER ASSEMBLYDESCRIPTION

5 This invention relates to a printing cylinder assembly and, in particular, to such an assembly in which a printing plate comprising a so-called "stereo" of a preferably flexible plastics material, such as, a photopolymeric material or natural or synthetic
10 rubber, is secured to a printing cylinder in proper registration therewith.

In a known technique for securing a stereo to a printing cylinder, the stereo is first secured to a
15 flexible or bendable carrier in proper registration therewith. Then, the carrier bearing the stereo is wrapped around the printing cylinder and secured thereto, again in proper registration therewith, by means of a so-called "Matthews strip" in the form of
20 a continuous length of plastics extrudate having a generally flat body portion to which the leading edge of the carrier is secured, for instance, by stapling, and a lip portion which is engaged in a correspondingly-shaped groove or slot in a lay bar extending along substantially the whole of the axial length of the cylinder. The other, trailing edge of the carrier is then attached to the cylinder in the region of its leading edge, usually by means of straps, to tension the carrier and associated stereo
25 around the cylinder in proper registration therewith.
30 One end of each strap hooks into a slot provided in the carrier adjacent the trailing edge thereof, whilst the other end of each strap hooks into the groove or slot of the lay bar attached to the cylinder. The straps are preferably slightly elastic to provide the necessary tensioning of the carrier bearing the stereo
35

around the cylinder.

- It has been found that this arrangement has certain disadvantages, in that one main drawback is
5 that the proper seating of the elongate hook portion in the groove or slot in the lay bar can be impaired due to dirt and other material collecting in that groove or slot during continued use, resulting in poor registration of the carrier and, hence, the stereo,
10 with respect to the cylinder. Another drawback with this known arrangement is that, for particularly long printing cylinders, such as those used for printing comparatively large widths of corrugated board, the Matthews strip can bend or otherwise distort during
15 and/or after continued use, again resulting in poor registration of the carrier and stereo with respect to the cylinder and, in some cases, resulting in the Matthews strip becoming disengaged from the lay bar.
- 20 In another prior art arrangement, the printing cylinder is provided with a detachable bar with a row of pins or studs spaced linearly along its length. A stereo is secured to one side of a double-sided adhesive carrier sheet which, along with the stereo,
25 is provided with a row of holes along the leading edge thereof. These holes are arranged to be received upon corresponding pins or studs of the bar and, when so-received and with the bar secured detachably to the cylinder along the axial length thereof, the other
30 side of the carrier sheet to which the stereo is adhered, is itself adhered directly to the cylinder in proper registration therewith. Once the stereo has been adhered to the cylinder, the lay bar is removed from both the stereo and cylinder.

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The main disadvantage with this known arrangement

- is that the stereo is adhered permanently to the cylinder and cannot be removed easily or readily therefrom. This dedicated cylinder arrangement means that the cylinder cannot be re-used with another
- 5 stereo. Also, any bubbles or other irregularities between the double-sided adhesive carrier sheet and the stereo and/or the cylinder can produce poor print quality.
- 10 In a further prior art arrangement used in so-called "reel-to-reel" printing, a lay bar with a row of pins or studs spaced along its length is secured detachably but temporarily to a printing cylinder along the axial length thereof, with a corresponding
- 15 row of holes arranged along the leading edge of a stereo or other type of printing plate, being received upon respective ones of the row of pins or studs of the lay bar. Then, once the printing plate has been located upon and secured to the cylinder, by, say,
- 20 adhesive, the lay bar is removed completely from the cylinder and plate, with the former bearing the latter being replaced on the printing machine.
- 25 The main drawback with this known reel-to-reel printing cylinder assembly is that the lay bar has to be removed from the printing cylinder, so that changing of the stereo or other printing plate can be effected, and the cylinder also has to be removed from the printing machine.
- 30 It is an object of the present invention to provide a printing cylinder assembly which overcomes, or at least substantially reduces, the disadvantages associated with the known printing cylinder assembly
- 35 arrangements discussed above.

In this specification including the claims thereof, the term "printing plate" may be referred to, as the case may be, as comprising a stereo which is secured or securable directly to a printing cylinder
5 or a combination of a stereo which is secured or securable indirectly to a printing cylinder by means of an intermediate carrier plate or sheet (hereinafter referred to as "a carrier") with respect to which the stereo is secured in proper registration thereof.
10 However, other types of printing plate may also be used.

Accordingly, one aspect of the invention resides in a printing cylinder assembly which comprises:

- 15 (a) a printing cylinder;
- 20 (b) first means which extends in a non-continuous manner along at least part of the axial length of the cylinder and which is secured to the cylinder; and
- 25 (c) a printing plate comprising second means arranged at or adjacent its leading edge and corresponding and engaging with said first means, preferably detachably, to secure the printing plate to the cylinder in proper registration therewith.
- 30 Preferably, the first means comprises a row of discrete points which may be spaced, preferably at regular intervals, along substantially the whole of the axial length of the cylinder, in which case, the second means may comprise a further row of discrete
35 points which are spaced along at least part of the leading edge of the printing plate at or adjacent

thereto and which correspond and engage with respective ones of the row of discrete points of the first means.

5 In a preferred embodiment, the printing plate comprises a stereo secured, optionally detachably, to an associated carrier, in which case, the latter is preferably secured detachably to the cylinder in proper registration therewith and lies intermediate
10 the cylinder and the stereo. Thus, the stereo can be secured to any associated carrier, such that it is in proper registration therewith and, thus in proper registration with the printing cylinder.

15 The row of discrete points of the first means of the printing cylinder may be in the form of a row of locating pins preferably spaced along substantially the whole of the axial length of the cylinder, whilst the row of discrete points of the second means of the
20 printing plate may be in the form of a row of spaced holes preferably extending along substantially the whole of the length of the leading edge of the stereo and corresponding with and being received upon respective ones of the row of pins of the first means.
25 In such an arrangement, the leading edge of the stereo may correspond with that of any associated carrier, in which case, the leading carrier edge may also be provided with a row of holes which correspond with respective ones of the row of holes along the leading
30 edge of the stereo and which may also be received upon respective ones of the row of locating pins spaced along, say, substantially the whole of the axial length of the cylinder.

35 Alternatively or additionally, the first means may comprise a plurality of holes spaced at least

partially along the axial length of the cylinder, which holes are in communication with a vacuum source, such as, the evacuated interior of the cylinder, in which case, the second means may be constituted by the 5 leading edge of the printing plate itself, whereby that leading edge is secured to the cylinder by its engaging sealingly with the vacuum holes. A similar vacuum securing arrangement may be provided for the trailing edge of the printing plate.

10

Alternatively or additionally again, the first means may comprise a plurality of magnetic points which are spaced along at least part of the axial length of the cylinder and are engaged firmly, but 15 preferably detachably, by corresponding magnetic means associated with the second means of the printing plate, for example, at the leading edge thereof.

A second aspect of the invention resides in a 20 printing cylinder assembly which comprises:

- (1) a printing cylinder;
- 25 (2) a row of spaced locating pins extending along at least part of the axial length of the cylinder and secured to the cylinder; and
- 30 (3) a printing plate comprising a row of spaced holes at or adjacent its leading edge, which holes correspond with respective ones of the row of locating pins and are received thereon, preferably detachably, to secure the printing plate to the cylinder in proper registration therewith.

35

Again, in a preferred embodiment, a stereo may be

- secured, optionally detachably, to an associated carrier, in which case, the latter is secured, preferably detachably, to the cylinder in proper registration therewith and lies intermediate the
5 cylinder and the stereo. Advantageously, the stereo is secured to any associated carrier, such that it is in proper registration therewith and, thus, in proper registration with the printing cylinder.
- 10 The leading edge of the stereo may also correspond with that of any carrier, in which case, the leading carrier edge may also be provided with a row of holes corresponding to that of the stereo.
- 15 Preferably, the row of spaced locating pins is mounted upon a bar extending at least partially along the axial length of the cylinder, which bar is secured, preferably permanently, to the cylinder. The bar may also have magnetic properties, as will be
20 discussed in more detail hereinbelow.

The trailing edge of the printing plate, such as that of a stereo and/or any associated carrier, may be secured to the cylinder at or adjacent the leading
25 edge of the plate in any suitable manner. For instance, that trailing printing plate edge may also be provided with a row of spaced holes corresponding to that of its leading edge, for receipt upon the cylinder pins. Alternatively, a plurality of elastic
30 straps may be used in a similar manner to that discussed above in relation to the first-mentioned known technique.

Alternatively or additionally, the assembly may
35 be provided with other means for at least assisting in the securement of the stereo and/or any associated

carrier or other printing plate to the printing cylinder. For example, vacuum means may be so provided, a preferred arrangement comprising an array of holes in the surface of the cylinder which are connected or connectable to a vacuum source for securing the stereo and/or any associated carrier or other printing plate to the cylinder surface in tight engagement and proper registration therewith. Such an array of holes may be in communication with the evacuated interior of the cylinder or any other suitable vacuum source.

Additionally or alternatively, magnetic means acting between the stereo and/or any associated carrier or other printing plate, may be used to enhance securement thereof to the cylinder.

The locating pins may be upstanding from the surface of the printing cylinder or may be located in an elongate recess therein. The recess may be elongate or a recess for each pin may be provided.

For reinforcing purposes in the region of the row of holes at or adjacent the leading edge of the stereo and/or any associated carrier or other printing plate, a suitably perforated strip or bar of, say, metal, may be provided thereon either attached to or separated therefrom, with its perforations in register with such holes and received upon respective ones of the cylinder pins. If the row of spaced locating pins is mounted upon a bar, such as that described above, having magnetic properties, then the perforated reinforcing strip or bar may also have such properties, so that it and the pin bar are attracted to each other magnetically, to assist in retaining the stereo and/or any associated carrier or other printing

plate securely upon the cylinder. A similar arrangement may be provided for the trailing edge of the stereo and/or any associated carrier or other printing plate when such is also provided with a row of holes for receipt upon respective ones of the row of spaced cylinder pins.

In a preferred embodiment of printing cylinder assembly in accordance with the invention, the row of holes along the leading edge, and optionally the trailing edge, of the stereo and/or any associated carrier or other printing plate are detachably received thereon, so that the stereo and any associated carrier or other printing plate can be removed from the cylinder and subsequently replaced by another, such as, another stereo or carrier with a different stereo mounted upon it. In this manner, the cylinder is not dedicated to, say, any one particular stereo, as are the prior art arrangements discussed above.

Throughout the inventive assembly, a critical factor is to provide proper registration between the printing plate, such as a stereo, and any associated carrier, and the printing cylinder, so that the printing process provides precise print registration. In this regard, any stereo is preferably located in proper registration with respect to any associated carrier by known computerised and video matrix aligning techniques, whilst the inventive assembly provides proper registration between the stereo and the printing cylinder. Also, the inventive assembly enhances the speed of changeover of stereos (printing plates), whilst further reducing downtimes.

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A third aspect of the invention provides a

printing cylinder comprising means which extend in a non-continuous manner along at least part of the axial length thereof, which is secured thereto and which is arranged to correspond and engage with second means arranged at or adjacent the leading edge of a printing plate to secure, in use, the printing plate to the cylinder in proper registration therewith.

The first-mentioned means of the cylinder may comprise a row of spaced locating pins which may extend along substantially the whole of the axial length of the cylinder and whose pins are arranged to correspond with and to receive thereon respective ones of a row of spaced holes located at or adjacent the leading edge of a printing plate in, say, the form of a stereo or a carrier bearing a stereo secured thereto and in proper registration therewith.

This third aspect of inventive printing cylinder may also comprise one or more of the features and/or optional modifications of the first and second aspects of the inventive assembly defined and discussed above.

A fourth aspect of the invention resides in a printing plate comprising means arranged at or adjacent the leading edge thereof and corresponding with and capable of engaging with further means extending in a non-continuous manner along at least part of the axial length of a printing cylinder, to secure, in use, the printing plate to the cylinder in proper registration therewith.

The means arranged at or adjacent the leading edge of the printing plate in the form of, say, a stereo or associated carrier preferably comprises a row of spaced holes extending at least partially

therealong and arranged to be received upon respective ones of a row of locating pins along at least part of the axial length of the printing cylinder, which row of pins constitutes, at least partially, the further
5 means of the printing cylinder.

Again, this fourth aspect of inventive printing plate may also comprise one or more of the features and/or optional modifications of the first and second aspects of inventive assembly defined and discussed
10 above.

It is to be understood that the non-continuous first means, including any derivatives thereof, for example, the row of spaced locating pins or other
15 discrete points spaced at least partially along the axial length of the cylinder, is, to all intents and purposes, secured permanently to the cylinder, possibly integrally therewith, for the purposes of normal usage of the inventive assembly, including
20 securing of a printing plate to the cylinder in proper registration therewith and/or the replacement of one printing plate with another upon the cylinder. It is to be understood further, however, that the first means may be detached from the cylinder for
25 purposes other than operational requirements, for example, for maintenance and/or repair purposes or, even, for replacing the first means with a conventional alternative, such as, a detachable continuous Matthews strip, as discussed above, in
30 which case, such a prior art arrangement would fall outside the scope of the inventive assembly described and claimed herein.

In order that the invention may be more fully
35 understood, preferred embodiments of printing cylinder assembly, printing cylinder and printing plate in

accordance therewith will now be described by way of example and with reference to the accompanying drawings in which:

5 Figure 1 is a partial perspective view of a first embodiment of printing cylinder assembly in accordance with the invention;

10 Figure 2 is an end view of the assembly shown in Figure 1 but not to scale; and

 Figure 3 is an end view of a second embodiment of printing cylinder assembly, again not to scale.

15 Referring firstly to Figures 1 and 2 of the drawings, a printing cylinder assembly in accordance with the invention and as indicated generally at 10, comprises a printing cylinder 11 with a bar 12 extending along the whole of the axial length thereof.
20 This bar 12 is formed as an integral part of the printing cylinder 11 and has secured to it a row of upstanding locating pins 13 spaced evenly along its length. In Figure 1, the length of the locating pins 13 is exaggerated for ease of illustration.

25 A printing plate comprises a stereo shown diagrammatically at 14, which is adhered to a carrier in the form of a sheet 15 in precise registration therewith by any suitable technique, such as, a computerised and video aligning technique.

30 A metallic strip 16 is secured to the leading edge 15' of the carrier sheet 15 and has a row of perforations 17 extending along its length. These perforations 17 lie in register with a row of holes 18 extending along the length of the leading edge 15' of

the carrier sheet 15. The dimensions and spacing of the perforations 17 in the strip 16 and the holes in the carrier sheet 15 correspond with those of the locating pins 13. In this manner, the perforations 17 and holes in the leading edge 15' of the carrier sheet 15 are receivable upon respective ones of the row of pins 13 of the printing cylinder 11, such that the carrier sheet 15, and associated stereo 14, is in proper registration with the cylinder 11.

10

As discussed above, the trailing edge 15" of the carrier sheet 15 can be secured to the cylinder 11 by any suitable means (not shown), although the strap arrangement discussed above is preferred.

15

With this inventive assembly 10, the printing plate in the form of the carrier sheet 15 and its associated stereo 14 can be removed from the cylinder 11 and replaced with another carrier and different 20 stereo.

Referring now to Figure 3 of the drawing, a second embodiment of inventive printing cylinder assembly 20 similar to that described above in relation to Figures 1 and 2, is shown but, in this embodiment, the row of locating pins 23 is located 25 within an elongate recess 29 extending along the axial length of the associated printing cylinder 21.

Again, a metallic strip 26 is secured to the leading edge 25' of a carrier sheet 25 and has a row 30 of perforations (not shown) extending along its length and lying in register with a row of holes (also not shown) extending along the length of the leading edge 35 25' of the carrier sheet 25.

The trailing edge 25" of the carrier sheet 25 can be secured to the cylinder 21 by any suitable means, as discussed above.

5 With this second embodiment of inventive assembly 20, the printing plate comprising the carrier sheet 25 and its associated stereo 24 can be removed from the cylinder 21 and replaced with another carrier and different stereo.

10 It is to be appreciated that the preferred embodiments of printing cylinder assemblies 10, 20 described above with reference to the accompanying drawings, are particularly useful in printing large widths of corrugated board or other similar material, in that the combination of the locating pins 13, 23 and the holes in the leading edge 15', 25' of the carrier strip 15, 25, provides proper incremental registration of the stereo 14, 24 along the whole 15 length of the associated printing cylinder 11, 21.

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Although the leading and trailing edges of the stereo 14, 24 stop short of the corresponding edges 15', 25' and 15", 25" of the carrier 15, 25, the 25 stereo 14, 24 may be extended such that at least its leading edge aligns with that of the carrier 15, 25. In such a case, the leading stereo edge will also be provided with a row of spaced holes which lie in register with the row of holes 18 at the leading 30 carrier edge 15', 25' and which are received and located upon the pins 13, 23. This arrangement provides added security of registration for the stereo 14, 24.

35 It is to be appreciated further that similar arrangements to those discussed above in relation to

the securement of a stereo-bearing carrier to the printing cylinder of the assemblies of the two preferred embodiments, may be used in conjunction with only a stereo, thereby eliminating the need for a
5 carrier.

Further, and as also discussed above, other means may be used to secure or assist in the securement of a printing plate, optionally in the form of a stereo or stereo-bearing carrier, to the printing cylinder. For example, magnetic means may be arranged to act between the printing cylinder and printing plate to assist in securing the leading and/or trailing edge of the latter to the non-continuous means extending at least partially along the axial length of the cylinder. Such magnetic means may also be used to assist in the securement of the printing plate to the surface of the printing cylinder. Similarly, vacuum means, preferably in the form of a row of holes extending at least partially, but preferably substantially totally, along the axial length of the cylinder and communicating with a vacuum source, such as the evacuated interior of the cylinder, may be engaged by the leading and/or trailing edge of the printing plate. Again, such vacuum means may be provided in association with the surface of the cylinder, for assisting in retaining the printing plate in securement and in proper registration therewith.
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CLAIMS

1. A printing cylinder assembly comprising:
 - 5 (a) a printing cylinder;
 - (b) first means arranged in a non-continuous manner along at least part of the axial length of the printing cylinder and which is secured to the cylinder; and
 - 10 (c) a printing plate comprising second means arranged at or adjacent the leading edge thereof and corresponding and engaging with said first means, to secure the printing plate to the cylinder in proper registration therewith.
2. An assembly according to claim 1, wherein the printing plate is secured detachably to the printing cylinder by means of said second means engaging detachably with said first means.
- 20 25 3. An assembly according to claim 1 or 2, wherein said non-continuous first means extends along substantially the whole of the axial length of the printing cylinder.
4. An assembly according to claim 1, 2 or 3, wherein said non-continuous first means comprises a row of discrete points spaced along at least part of the axial length of the printing cylinder.
- 30 35 5. An assembly according to claim 4, wherein said second means comprises a row of discrete points which are spaced along at least part of the leading edge of the printing plate at or adjacent thereto and which

correspond and engage with respective ones of the row of discrete points of said first means.

5 6. An assembly according to claim 4 or 5, wherein the row of discrete points of said first means are spaced at regular intervals along at least part of the axial length of the printing cylinder.

10 7. An assembly according to any of claims 4 to 6, wherein said first means comprises a row of spaced locating pins.

15 8. An assembly according to claim 7, wherein said second means comprises a row of spaced holes corresponding with and being received upon respective ones of the row of locating pins of said first means.

20 9. An assembly according to any of claims 4 to 8, wherein the row of discrete points of said first means comprises or further comprises, as the case may be, a row of holes in the surface of the printing cylinder, which holes communicate or are communicable with a vacuum source.

25 10. An assembly according to claim 9, wherein the interior of the printing cylinder is evacuated, to provide the vacuum source with which the row of holes communicates or is communicable.

30 11. An assembly according to any preceding claim, wherein the printing plate comprises a stereo.

35 12. An assembly according to any preceding claim, wherein the printing plate comprises a stereo secured to a carrier in proper registration therewith, the carrier being secured to the printing cylinder in

proper registration therewith and being intermediate the stereo and printing cylinder.

5 13. An assembly according to claim 12, wherein the stereo is secured detachably to the carrier.

10 14. An assembly according to claim 12 or 13, wherein the leading edge of the stereo corresponds generally with the leading edge of the carrier.

15 15. An assembly according to claim 14, wherein the leading stereo edge is provided with a row of holes which correspond with respective ones of a row of holes along the leading carrier edge, with both rows of holes constituting said second means of the printing plate.

16. A printing cylinder assembly comprising:

20 (1) a printing cylinder;

25 (2) a row of spaced locating pins extending along at least part of the axial length of and secured to the printing cylinder; and

30 (3) a printing plate having a row of spaced holes at or adjacent the leading edge thereof, which holes correspond with respective ones of the row of pins and are received thereon, to secure the printing plate to the cylinder in proper registration therewith.

35 17. An assembly according to claim 16, wherein the row of spaced locating pins extends along substantially the whole of the axial length of the printing cylinder.

18. An assembly according to claim 16 or 17, wherein the printing plate is secured detachably to the printing cylinder by means of the row of holes at or adjacent the leading edge of the printing plate being received removably upon respective ones of the row of spaced locating pins of the cylinder.
5
19. An assembly according to claim 16, 17 or 18, wherein the row of locating pins are spaced at regular intervals along at least part of the axial length of the printing cylinder.
10
20. An assembly according to any of claims 16 to 19, wherein the printing plate comprises a stereo.
15
21. An assembly according to any of claims 16 to 20, wherein the printing plate comprises a stereo secured to a carrier in proper registration therewith, the carrier being secured to the printing cylinder in proper registration therewith and being intermediate the stereo and printing cylinder.
20
22. An assembly according to claim 21, wherein the stereo is secured detachably to carrier.
25
23. An assembly according to claim 21 or 22, wherein the leading ledge of the stereo corresponds generally with the leading edge of the carrier.
- 30
24. An assembly according to claim 23, wherein the leading stereo edge is provided with a row of holes which correspond with respective ones of a row of holes along the leading carrier edge, with both rows of holes being received upon respective ones of the row of locating pins of the printing cylinder.
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25. An assembly according to any of claims 16 to 24, wherein the row of spaced locating pins is mounted upon a bar extending along substantially the whole of the axial length of the cylinder.
- 5
26. An assembly according to claim 25, wherein the bar is secured permanently to the cylinder.
- 10
27. An assembly according to any of claims 16 to 26, wherein the trailing edge of the printing plate is secured to the cylinder by strap means.
- 15
28. An assembly according to any of claims 16 to 27, wherein the trailing edge of the printing plate is secured to the cylinder at or adjacent the leading edge of the carrier.
- 20
29. An assembly according to any of claims 16 to 28, wherein the trailing edge of the carrier plate is provided with a row of spaced holes corresponding to respective ones of the row of spaced holes at or adjacent the leading edge of the printing plate and received upon respective ones of the row of locating pins of the printing cylinder.
- 25
30. An assembly according to any of claims 16 to 29, wherein the row of locating pins upstand from the surface of the cylinder.
- 30
31. An assembly according to any of claims 16 to 29, wherein the locating pins are located in a recess in the surface of the cylinder.
- 35
32. An assembly according to claim 31, wherein the recess is elongate.

33. An assembly according to claim 31, wherein a recess for each pin is provided.
- 5 34. An assembly according to any of claims 16 to 33, wherein, for reinforcing purposes in the region of the row of holes at or adjacent the leading edge of the printing plate, a perforated strip is provided, with at least some of its perforations lying in register with respective holes and being received upon 10 respective ones of the row of locating pins.
- 15 35. An assembly according to claim 34 when dependent upon claim 25 or upon any of claims 26 to 33 when dependent upon claim 25, wherein the bar upon which the row of locating pins is mounted, is magnetic and wherein the perforated strip is also magnetic, such that the magnetic attraction therebetween assists in securing the printing plate to the printing cylinder.
- 20 36. An assembly according to any of claims 16 to 35 including a row of holes in the surface of the printing cylinder extending along at least part of the axial length thereof at or adjacent the leading and/or trailing edge of the printing plate, which holes 25 communicate or are communicable with a vacuum source and are engaged sealingly by the leading edge of the printing plate.
- 30 37. An assembly according to claim 36, wherein the interior of the printing cylinder is evacuated, to provide the vacuum source with which the row of holes communicate or are communicable.
- 35 38. An assembly according to any of claims 16 to 37, wherein the printing plate comprises a stereo.

39. An assembly according to any of claims 16 to 38, wherein the printing plate comprises a stereo secured to a carrier in proper registration therewith, the carrier being secured to the printing cylinder in proper registration therewith and being intermediate the stereo and printing cylinder.
40. An assembly according to claim 39, wherein the stereo is secured detachably to the carrier.
- 10 41. An assembly according to claim 39 or 40, wherein the leading edge of the stereo corresponds generally with the leading edge of the carrier.
- 15 42. An assembly according to claim 41, wherein the leading stereo edge is provided with a row of holes which correspond with respective ones of the row of holes at or adjacent the leading carrier edge, with both rows of holes being received upon respective ones of the row of locating pins.
- 20
43. An assembly according to any of claims 39 to 42, wherein the stereo has been located in proper registration with respect to the carrier by a computerised and video aligning technique, such that the assembly provides proper registration between the carrier, and hence the stereo, and the cylinder.
- 25
44. An assembly according to any of claims 39 to 43, wherein the carrier and stereo are removable from the cylinder and subsequently replaceable thereon with another or the same carrier with a different stereo secured thereon.
- 30
45. An assembly according to any preceding claim, including magnetic means acting between the cylinder
- 35

and printing plate, for assisting in securing the plate to the cylinder in proper registration therewith.

5 46. An assembly according to any preceding claim including vacuum means acting sealingly between the cylinder and printing plate, for assisting in securing the plate to the cylinder in proper registration therewith.

10 47. An assembly according to claim 46, wherein said vacuum means comprises an array of holes in the surface of the cylinder, which holes communicate or are communicable with a vacuum source and are engaged 15 sealingly with the printing plate.

20 48. An assembly according to claim 47, wherein the interior of the cylinder is evacuated to provide the vacuum source with which the holes in the surface of the cylinder communicate or are communicable.

25 49. A printing cylinder comprising means extending in a non-continuous manner along at least part of the axial length thereof and arranged to correspond and engage with second means at or adjacent the leading edge of a printing plate to secure, in use, the printing plate to the cylinder in proper registration therewith, wherein said first-mentioned, non-continuous means is secured to the cylinder.

30 50. A printing cylinder according to claim 49, wherein said first means comprises a row of spaced locating pins extending along substantially the whole of the axial length of the cylinder and arranged to correspond with and to receive thereon respective ones 35 of a row of spaced holes located at or adjacent the

leading edge of a printing plate, the row of holes constituting, at least partially, said second means of the printing plate.

5 51. A printing plate comprising means arranged at or adjacent its leading edge and corresponding with and capable of engaging with further means extending in a non-continuous manner along at least part of the axial length of a printing cylinder, to secure, in use, the
10 printing plate to the cylinder in proper registration therewith.

15 52. A printing plate according to claim 51, wherein said means arranged at or adjacent the leading edge of the plate comprises a row of spaced holes extending at least partially therealong and arranged to be received upon respective ones of a row of locating pins spaced along at least part of the axial length of a printing cylinder, which row of pins constitutes, at least
20 partially, said further means of the printing cylinder.

25 53. A printing plate according to claim 51 or 52 comprising a stereo or a carrier bearing a stereo secured thereto in proper registration therewith.

30 54. A printing cylinder assembly substantially as hereinbefore described with reference to the accompanying drawing.

35 55. A printing cylinder substantially as hereinbefore described with reference to the accompanying drawing.

35 56. A carrier bearing a stereo substantially as hereinbefore described with reference to the accompanying drawing.

Relevant Technical Fields

- (i) UK Cl (Ed.M) B6C: CJB, CKF, CMA, CML
 (ii) Int Cl (Ed.5) B41F 027/12

Search Examiner
F MILES

Databases (see below)

(i) UK Patent Office collections of GB, EP, WO and US patent specifications.

(ii)

Date of completion of Search
23 FEBRUARY 1994

Documents considered relevant following a search in respect of Claims :-
1,16,49

Categories of documents

- | | | | |
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| X: | Document indicating lack of novelty or of inventive step. | P: | Document published on or after the declared priority date but before the filing date of the present application. |
| Y: | Document indicating lack of inventive step if combined with one or more other documents of the same category. | E: | Patent document published on or after, but with priority date earlier than, the filing date of the present application. |
| A: | Document indicating technological background and/or state of the art. | &: | Member of the same patent family; corresponding document. |

Category	Identity of document and relevant passages		Relevant to claim(s)
X	GB 1073139 A	(ROTAPRINT) LITHO	1,16,49
X	GB 0851841 A	(TIMSONS) FLEXO	1,16,49
X	GB 0233932 A	(ROGERS) MIMEO	1,16,49
X	EP 0214549 A	(TORAY) LITHO	1,16,49
X	US 5088408 A	(PHILPOT) FLEXO	1,16,49
X	US 4291621 A	(THOMAS) MIMEO	1,16,49

Databases: The UK Patent Office database comprises classified collections of GB, EP, WO and US patent specifications as outlined periodically in the Official Journal (Patents). The on-line databases considered for search are also listed periodically in the Official Journal (Patents).

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Relevant Technical Fields

- (i) UK Cl (Ed.M) B6C: CMA, CMB, CMC, CMM, CMP
 (ii) Int Cl (Ed.5) B41F: 027/02; 027/12

Databases (see below)

(i) UK Patent Office collections of GB, EP, WO and US patent specifications.

(ii) ONLINE DATABASES: WPI

Search Examiner
 F MILES

Date of completion of Search
 25.3.94

Documents considered relevant following a search in respect of Claims :-
 1,16,49,51

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| Y: | Document indicating lack of inventive step if combined with one or more other documents of the same category. | E: | Patent document published on or after, but with priority date earlier than, the filing date of the present application. |
| A: | Document indicating technological background and/or state of the art. | &: | Member of the same patent family; corresponding document. |

Category	Identity of document and relevant passages		Relevant to claim(s)
A	GB 2061882 A	(ROTAPRINT) note trailing edge retainer 138 in Figure 6	1,16,49, 51 at least
Y	GB 2202186 A	(RISO) whole document	1,16,49, 51 at least
X	US 4628815 A	(KANEGAN) note plural magnets in lines 19 to 21 in column 3	1,16,49, 51 at least
A	US 4561355 A	(CUIR) note vacuum groove to retain plate	1,16,49, 51 at least
X	US 3496866 A	(NYSRTRAND) note that magnet strips are composed of alternating magnets and spacers	1,16,49, 51 at least

Databases: The UK Patent Office database comprises classified collections of GB, EP, WO and US patent specifications as outlined periodically in the Official Journal (Patents). The on-line databases considered for search are also listed periodically in the Official Journal (Patents).